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METALLURGICAL ENTERPRISES ADOPT SPECTRO-ANALYSIS

/Numbers in parentheses refer to appended sources./

Soviet scientists have developed a special apparatus, named the "stiloskop," for spectro-analysis of metals. The instrument determines in ferrous metals the percent of 13 different elements, such as chromium, tungsten, manganese, vanadium, molybdenum, etc., and also analyzes various nonferrous alloys. This apparatus can be used for analysis of parts in assembly and also for observations in foundries during the process of smelting, thereby preventing defects in the melt. The analysis takes only 3 to 5 minutes and the "stiloskop" is so designed that it can be used under any plant conditions. A laboratory assistant with general 7th-grade education can, without special training, learn to make analyses within one or 2 months. Soviet plants are now producing excellent instruments for spectro-analysis.

N. Lyubimov, assistant to the Chair of Physics, Kishinev State University, Moldavian SSR, points out that spectro-analysis of metals is not being used by any metal-processing enterprises in the Moldavian SSR. The Moldavian Council of Scientific Engineering and Technical Societies has not taken any measures to organize spectro-analysis laboratories in Moldavia, despite the fact that there is abundant equipment for such laboratories in the material and technical supply base of the Council of Ministers Moldavian SSR. Spectro-analysis laboratories might well be established in Kishinev, Tiraspol', Bendery, and Bel-tsy.

The Plant imeni Molotov in Moscow has used spectro-analysis to regrade thousands of tons of steel scrap and the Leningrad Plant imeni Kirov has entirely eliminated production defects in smelting, which were formerly as high as 30 percent, by using the "stiloskop." The Odessa spectro-analysis laboratories make as many as 100 analyses per month for the automobile repair plant of the Ministry of Automobile Transport (1). In Moscow, the "Serp i molot" Metallurgical Plant has decided to organize a spectro-analysis laboratory in its first open-hearth shop (2).

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V. Abramov, chief, Central Laboratory of the Plant imeni Lepse in Leningrad, reports that the plant recently converted to the use of spectral, instead of chemical, analysis of wrought iron because of the complexity and time consumed in chemical analysis. The plant's laboratory was particularly unsuccessful in detecting accurately the quantity of silicon in wrought iron by chemical processes, and usually took from 40 minutes to 2 hours to complete the job. Another method had to be found.

The laboratory's workers first learned to detect manganese and chrome by using a "stiloskop" and silicon by spectrograph, but for a long time, did not achieve the expected results in detecting silicon. The USSR has developed a method of detecting silicon by spectral analysis, but the plant found this difficult to adopt since it requires a high-voltage spark unit and special safety measures. The laboratory then developed a method of detecting silicon with an alternating current arc, and can now do this analysis with a great degree of accuracy. Professor V. K. Prokof'yev and K. I. Tagarov, [illegible] permanent director of the plant's spectro-analysis laboratory, worked on this problem with plant workers.

The lab has also worked out the procedure for detecting carbon in wrought iron. It now takes 2-3 minutes to detect manganese and chrome and 20-25 minutes for silicon. The number of samples undergoing analysis has increased and the cost of making one analysis has decreased by one third.

In the last 4 months, after converting from chemical analysis, the lab has completed more than 10,000 analyses by the new method, with subsequent savings of 500 kilograms of hydrochloric acid, 230 of phosphoric acid, 250 of nitric acid, 400 of sulfuric acid, and 1,200 grams of silver nitrate, and also saved on expensive and scarce reagents, electric power, electric heating instruments, etc. The lab is now working toward introducing a method for detecting phosphorus in wrought iron by spectro-analysis, has developed a method for quantitative analysis of high alloy steels and slags, and also will put smelting completely under the control of the spectro-analysis method. Courses directed by scientific workers are being organized to advance the qualifications of the laboratory's workers (3).

Other new methods are being adopted by the metallurgical industry. A new type of ventilator will be put into use on a wide scale throughout the mining and metallurgical industry. The Ministry of the Metallurgical Industry has awarded a prize to its three designers, Ya. Svyadoshch, secretary of the Leninogorsk City Party Committee and a metallurgical technician, V. Bogatov, director of the Leninogorsk Polymetallic Combine, and G. Miller, mechanical engineer of the combine. The ventilator substantially reduces the dust content of the air in underground workings, as indicated in tests carried out in the Leninogorsk Combine and in the Mine imeni K. Liebknekht of the "Krivbassruda" Trust (4).

Professors and scientific associates of the Ural Polytechnical Institute are actively participating in the introduction of high-speed methods in metallurgical enterprises. Professor Pal'mov, his assistant Gur'yanov, and engineers of the Revda Metal Goods and Metallurgical Plant have worked out a method for high-speed wire drawing. Umrikhin, head of the Chair of Metallurgy, together with engineers of the Serov and Verkh-Isetskiy plants have found methods of speeding open-hearth smelting. The Chair of Gas- and Furnace-Heat Engineering has developed new jets which speed open-hearth smelting and which have been introduced in the "Uralmash" Plant (5). In Leningrad, Professor M. M. Karnoukhov, Corresponding Member of the Academy of Sciences USSR, and Professor N. A. Kuznetsov, are also currently working on problems related to high-speed steel smelting (6).

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1. Sovetskaya Moldaviya, No 189, 20 Sep 49
2. Vechernyaya Moskva, No 278, 24 Nov 49
3. Leningradskaya Pravda, No 239, 9 Oct 49
4. Kazakhstanskaya Pravda, No 173, 4 Sep 49
5. Trud, No 266, 11 Nov 49
6. Leningradskaya Pravda, No 292, 13 Dec 49

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